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cc: \_\_\_\_\_

From: Phuong-Quan HoangFax #: (949) 380-5254Unisys CorporationM/S 40025725 Jeronimo RoadMission Viejo, California 92691Phone #: (949) 380-5643

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Subject: Application Serial No. 09/345,289Attorney Docket #04MV1073 Amendment to Final Office ActionExaminer: Charles E. AnyaConfidential

Messages:

URGENT! PLS DO NOT DELAYPLS CALL FOR PICK-UPPLS HAND DELIVER

Attached Amendment to Final Office

Action mailed on 4/6/04 is being sent in

Two parts. Part I has 29 pages, Part II has 30 pages.

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# XML and the Industry

## -Standards

- W3C open standard on Feb 10, 1998.
- OMG XMI - March 23, 1999
- Additional standards in progress:
  - XLink/XPointer, Namespaces, XSL, RDF, DOM, SAX, Web-DAV

## -Support is exploding

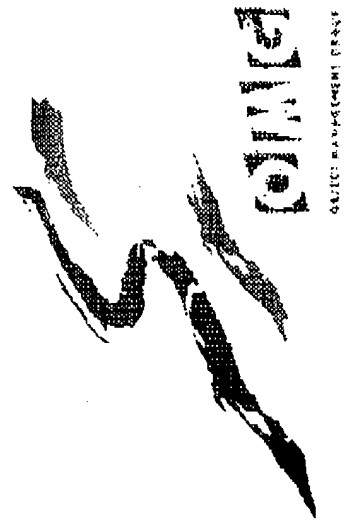
- 40+ books on Amazon.com in < 1 year
- XML supported by Adobe, ArborText, DSTC, HP, IBM, Microsoft, Netscape, Oracle, Platinum, Unisys, Select, Sun, Xerox
- Web, publishing, repositories, modeling, databases/warehouses, services, financial, health care, semiconductors, ...



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## XML benefits

- XML is system & vendor independent
- Proven with HTML on the web
- Metadata delivery via the web
- Validation, tool support, low cost of entry
- Advanced linking across the net
- Stylesheets for views, transforms
- Widespread industry support



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## Object Management Group

- Open, vendor-neutral, international, widely-recognized, rapid standardization process
- Over 800 members
- Approx. 90 technology processes underway, ranging from networking infrastructure to Air Traffic Control
- Strong liaison with ISO, ITU-T, W3C, TINA-C, etc.
- Liasion recently established with the Meta Data Coalition



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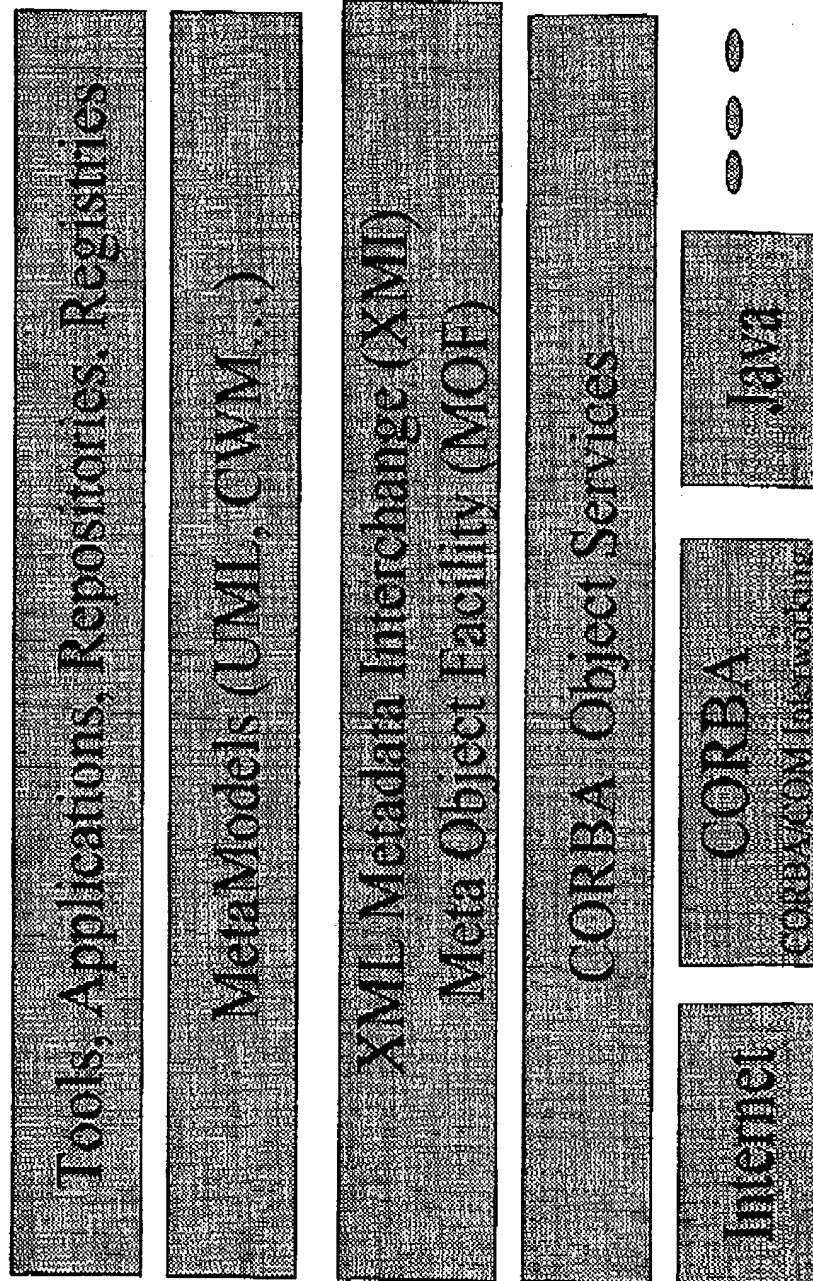
# Why OMG for Metadata Standards?

- OMG understands heterogenous interoperability & technology evolution
  - OMA, CORBA, IIOP, UML, XMI, MOF...
  - OMG is not just about CORBA anymore!
- Open standards process that works
  - Strong architectural foundation in CORBA, MOF, and UML
  - XMI happened from inception to adoption in about a year
- The place where technology integration via an open process is happening rapidly
  - XMI Unifies UML, MOF and XML so developers can model, manage and publish metadata to the web in a standard manner

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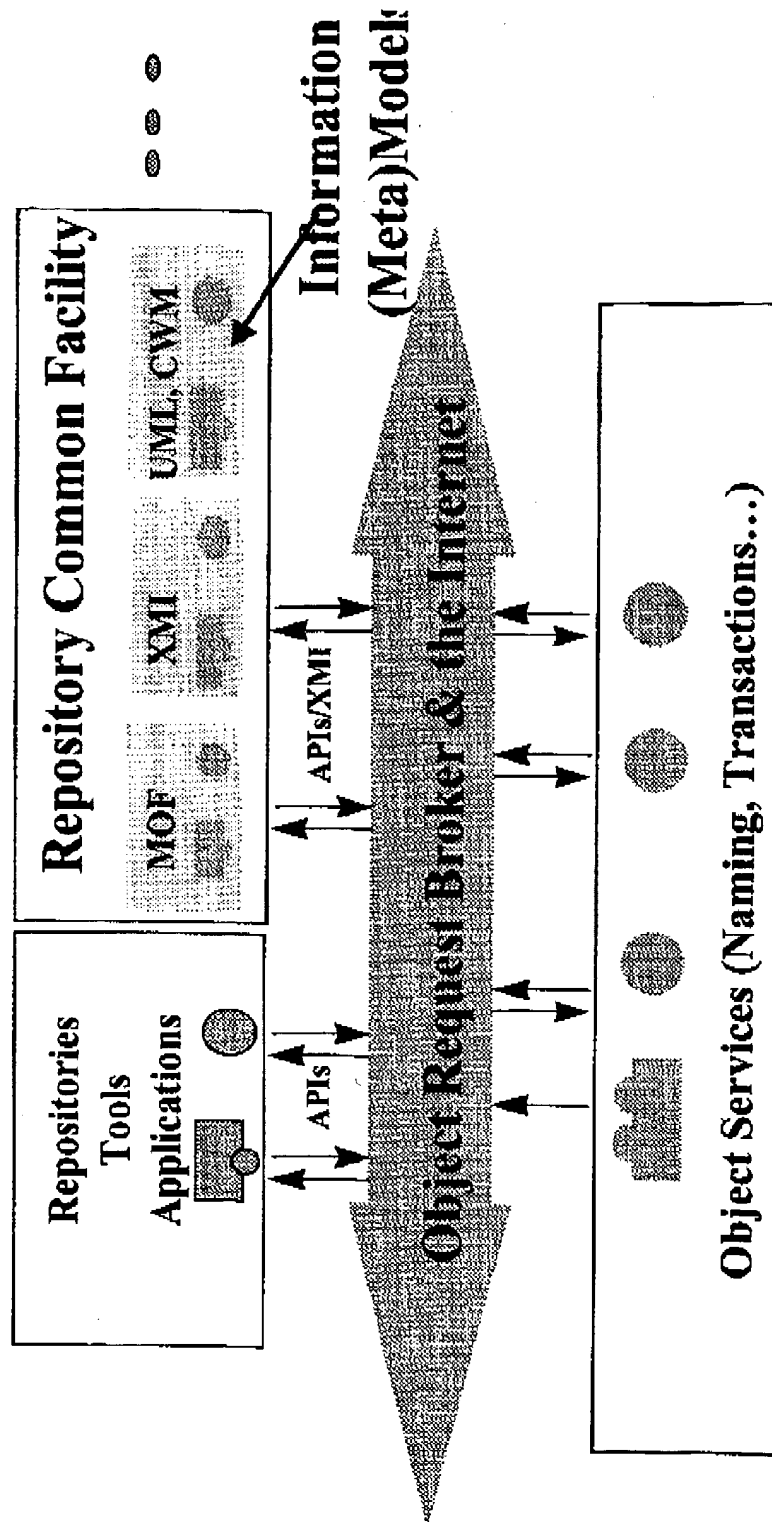
# OMG Repository and Modeling Architecture



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# OMG Distributed Metadata Architecture



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# Purpose and Benefits of XMI

- Purpose
  - Vendor and middleware neutral open interchange format for metadata in distributed environments
  - Start with modeling and programming metadata, expand to datawarehouse, components, registries...
- Benefits
  - Works with the Internet and builds on existing industry standards (XML, UML, MOF...)
  - Easy for vendors to implement in current products
  - Loosely coupled architecture
  - Breaks the wall between incompatible tools, repositories and applications across the Internet



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## XMI : The Players

- Technology Submitted by:

Unisys, IBM, DSTC, Oracle, Platinum,  
Fujitsu, Softeam, Reccerca, Daimler-Benz

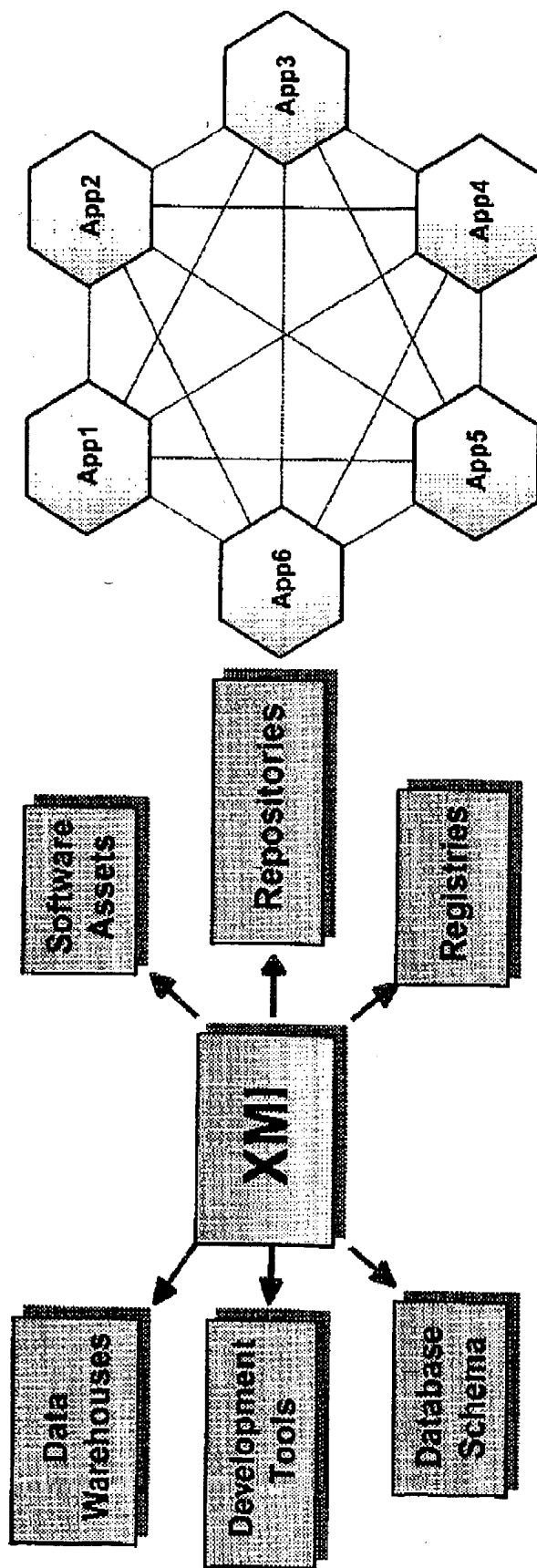
- Technology Submission Supported by:

Genesis, Inline, Rational, Select, Sprint, Cayenne,  
Sybase, Xerox, MCI Systemhouse, Boeing, Ardent,  
Aviatis, ICONIX, Integrated Systems, Verilog,  
Telefonica I+D, Universitat Politecnica de Catalunya,  
NCR, Nihon Unisys, NTT

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# Open Interchange with XMI



$N*N-N = 30$  bridges written  
by  $N = 6$  vendors.  
Versioning issues.

6 bridges written by 6 vendors.

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# Overview of XMI

- Use W3C Extensible Markup Language (XML) for the transfer syntax and interchange format
  - Specify XML Document Type Definitions (DTD) to enable transfer and verification of
    - MOF based meta(models) and their instances (Allows use of XMI in new domains - Data Warehouse, Components, Business Applications...)
    - UML based models (using UML DTD)
- Specify a precise MOF to XML mapping
  - Allows interchange of any MOF based metamodel and corresponding models (MOF--> XML Stream)
  - Enables automatic generation of DTDs for any MOF based metamodel (MOF --> XML DTD)
- Use UML for (meta)model design



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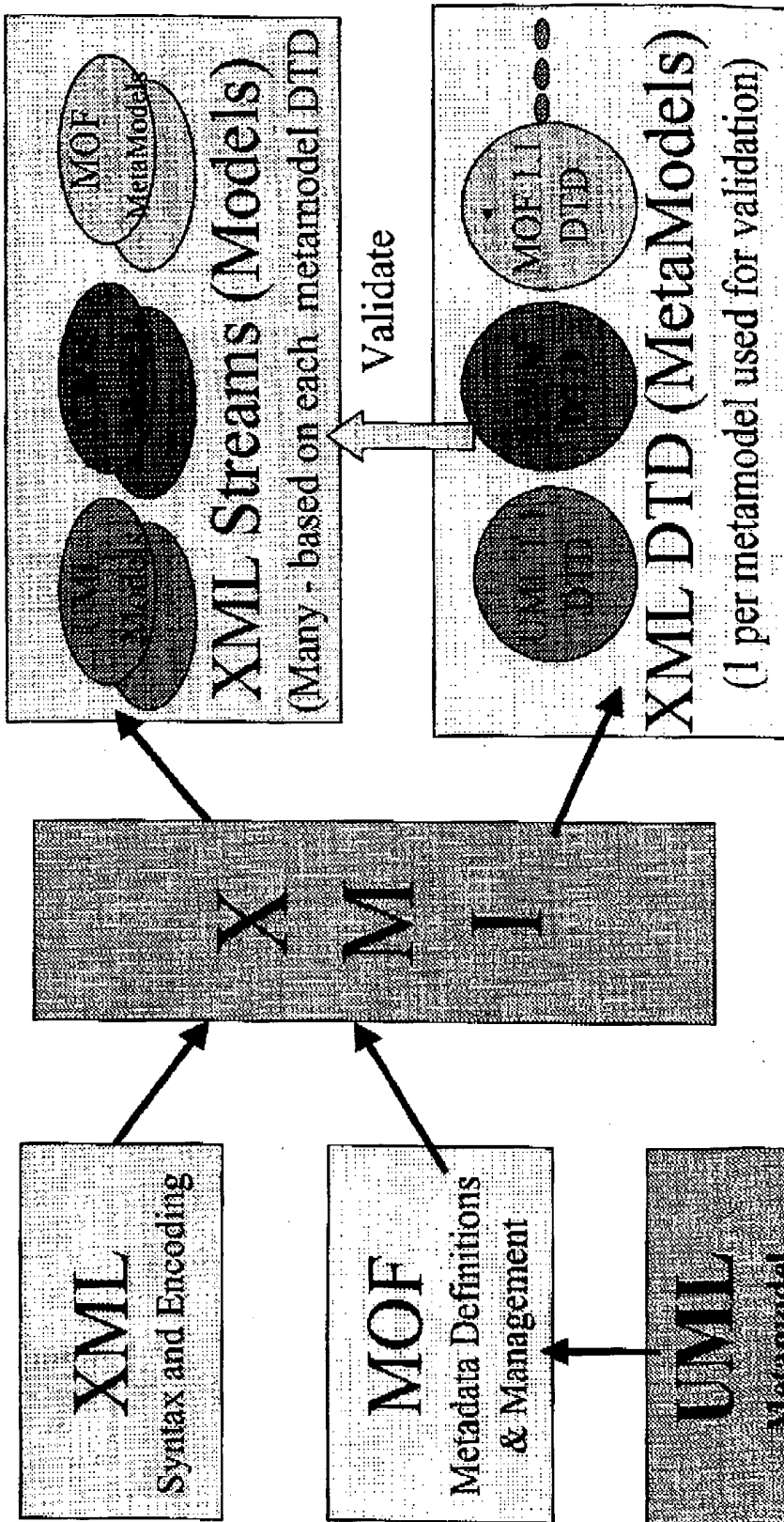
## OMG Meta Object Facility (MOF)

- OMG's Repository interoperability standard
- Uses UML notation and modeling constructs
- Allows Information (meta) model design using UML
- Provides distributed metadata service APIs (MOF to CORBA IDL transformation rules)
- Provides distributed metadata interchange using XMI (MOF to XML transformation rules)
- The transformation rules are part of the standard

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# XMI Simplified

**WWW.OMG.ORG : ad/98-10-05, ad/98-10-06**

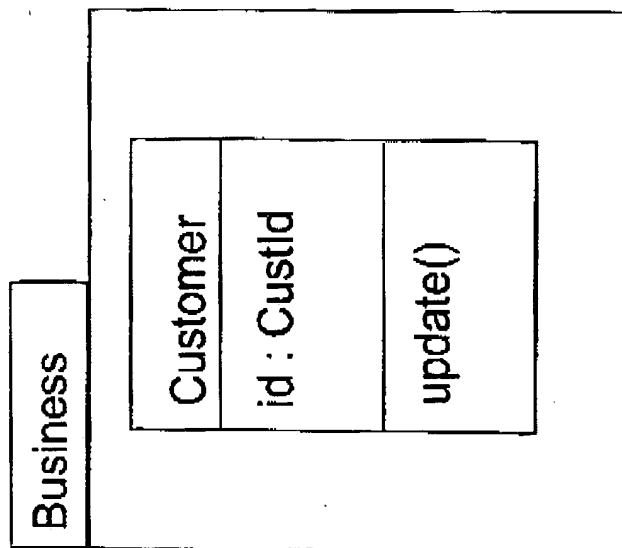


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# XMI - Hello World!



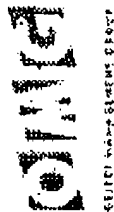
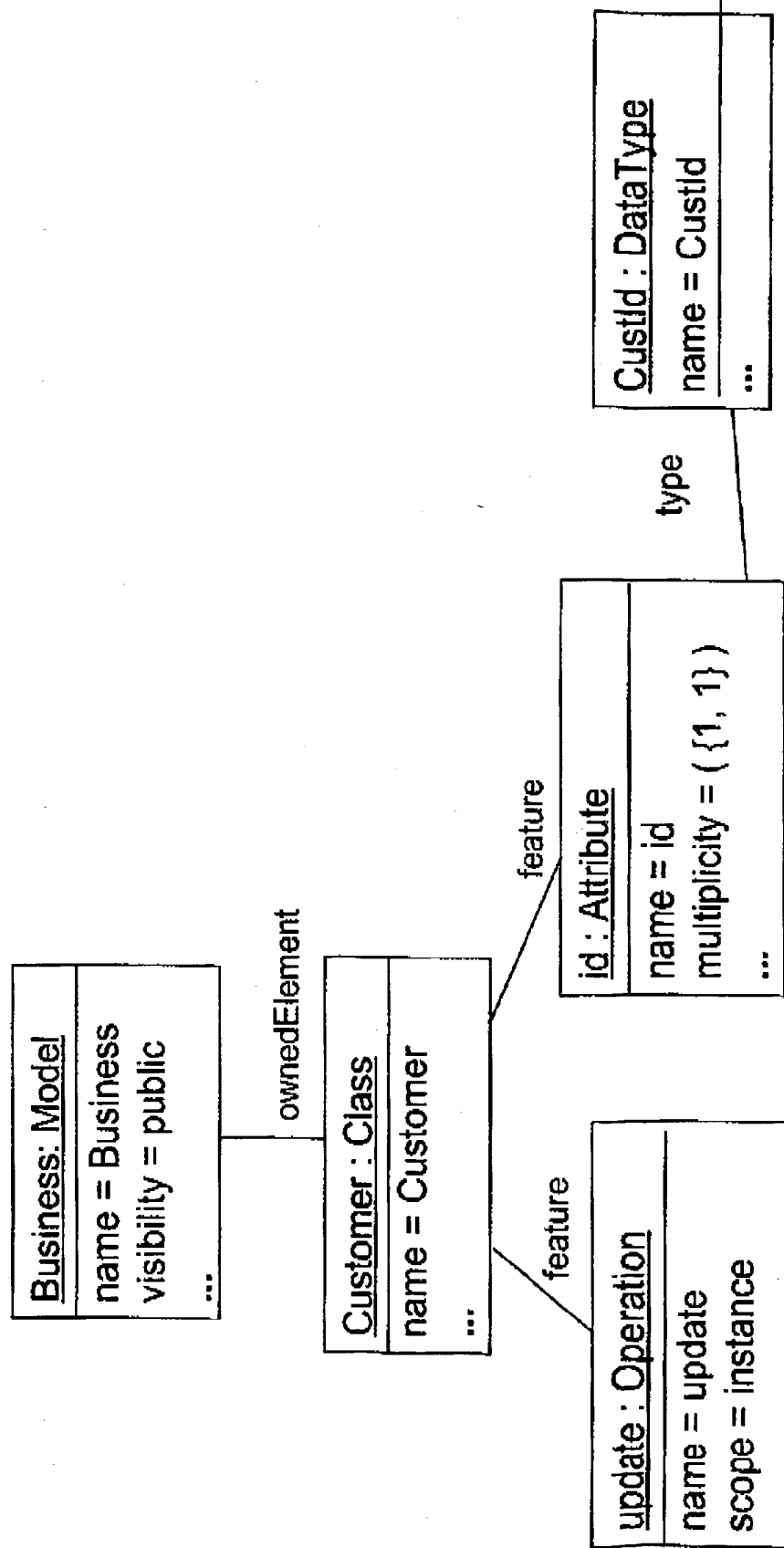
Let us Pretend that this is a trivial (meta)model or schema

# SECRET

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# As a Metamodel based on MOF

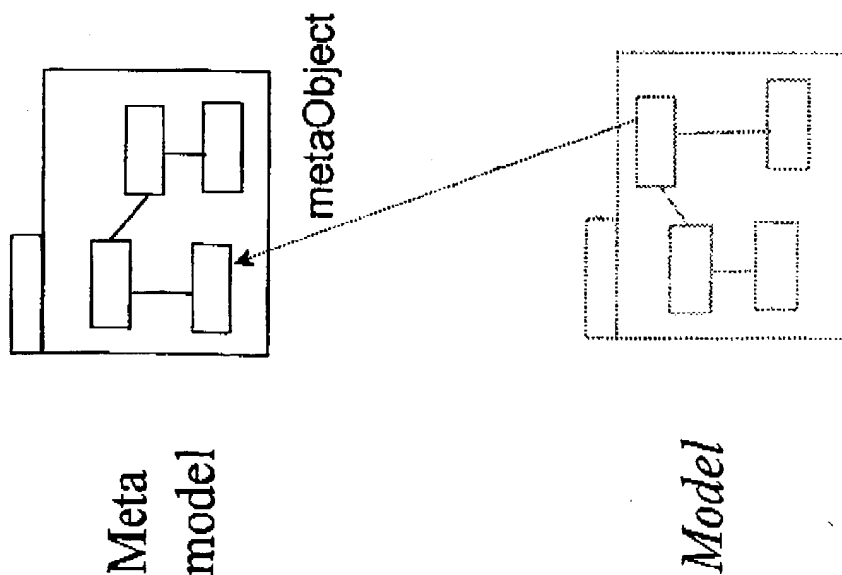
## UML Object Diagram



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# Tags from metamodel,

## Content from model



```

<Model>
  <name>Business</name>
  <visibility xmi.value="public"/>
  <Class>
    <name>Customer</name>
    <feature>
      <Attribute>
        <name>id</name>
        <multiplicity>
          <XML.field>1</XML.field>
          <XML.field>1</XML.field>
        </multiplicity>
      </Attribute>
    </feature>
  </Class>
</Model>

```

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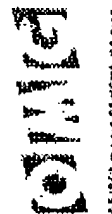
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## As an XML Document Fragment

```
<!-- Document Prologue, etc. -->
<Model xmi.id="a1"> <name>Business</name><visibility xmi.value="public"/>
<ownedElement>
  <Class xmi.id="a7"><name>Customer</name>
    <feature>
      <Attribute><name>id</name>
        <multiplicity><XML.field>1</ XML.field>
          <XML.field>1</ XML.field></multiplicity>
        <type>< DataType href="ja247"/></type>
      </Attribute>
      <Operation><name>update</name>
        <scope xmi.value="instance"/>
      </Operation>
    </feature>
  </Class>
</ownedElement>
</Model>
```

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The Unisys logo, featuring the word "unisys" in a stylized, lowercase font with a circular graphic element to the left.

# UML DTD Fragment (UML 1.1 DTD)

```

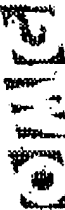
<!ELEMENT Class
    (name, visibility, isRoot, isLeaf, isAbstract, isActive,
    XML.extension*,
    constraint*, requirement*, provision*, stereotype*,
    elementReference*, collaboration*, partition?,
    template?, view*, presentation*,
    namespace?, behavior*, binding?
    implementation*, generalization*, specialization*,
    parameter*, structuralFeature*, specification*,
    associationEnd*, participant*, createAction*,
    instance*, classifierRole*, realization*,
    classifierInState*, taggedValue*, ownedElement*,
    feature*)?>

<!ATTLIST Class XML.element.att; XML.link.att;>
<!ELEMENT name (#PCDATA | XML.reference)*>
<!ELEMENT feature (Feature| StructuralFeature| Attribute| BehavioralFeature| Operation|
    Method Reception)*>

```

...

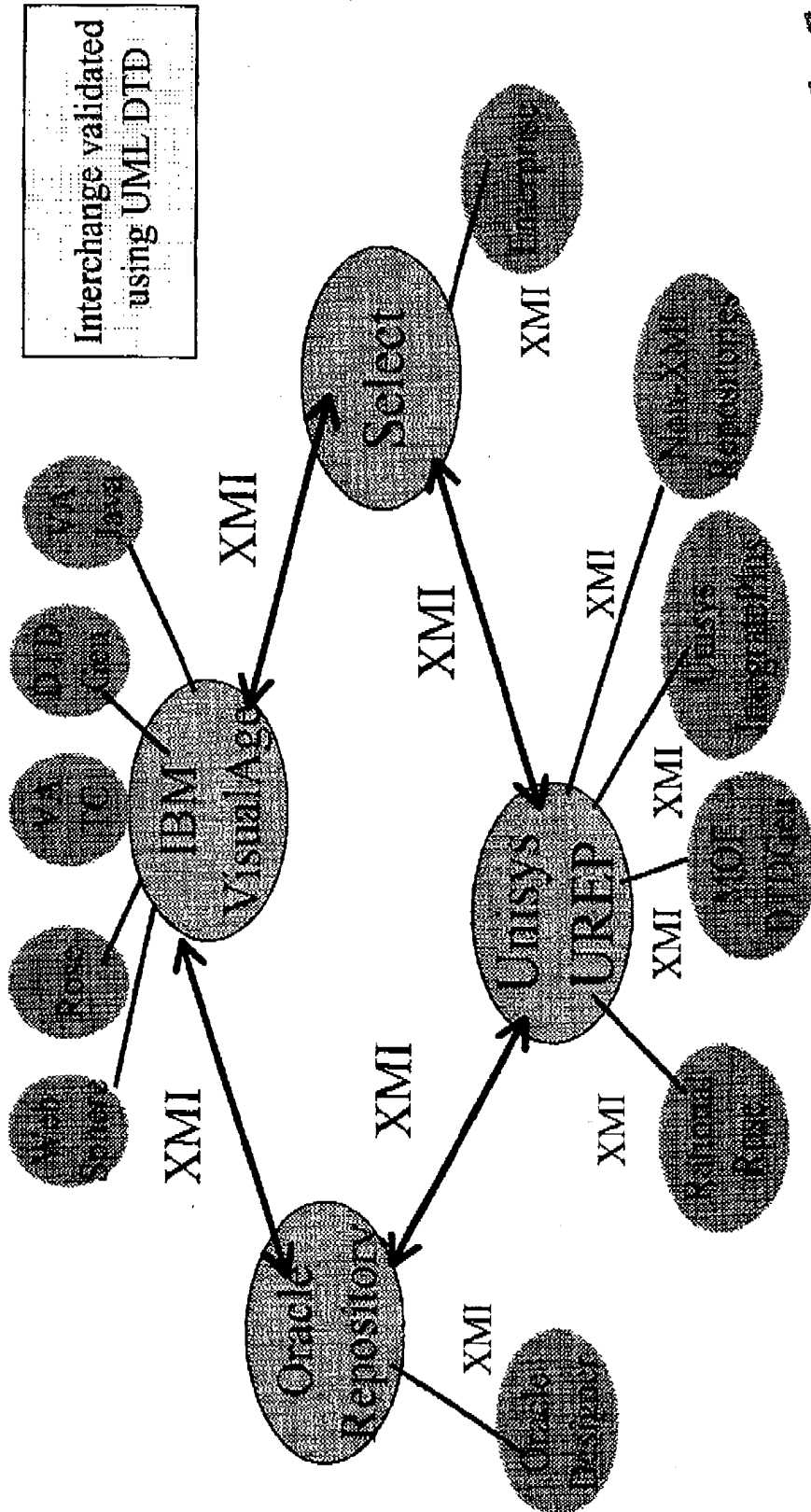
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# XMI Works

## XMI Interoperability Demo : Nov 98



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# Distributed Object Repository Architecture (Unisys UREP)

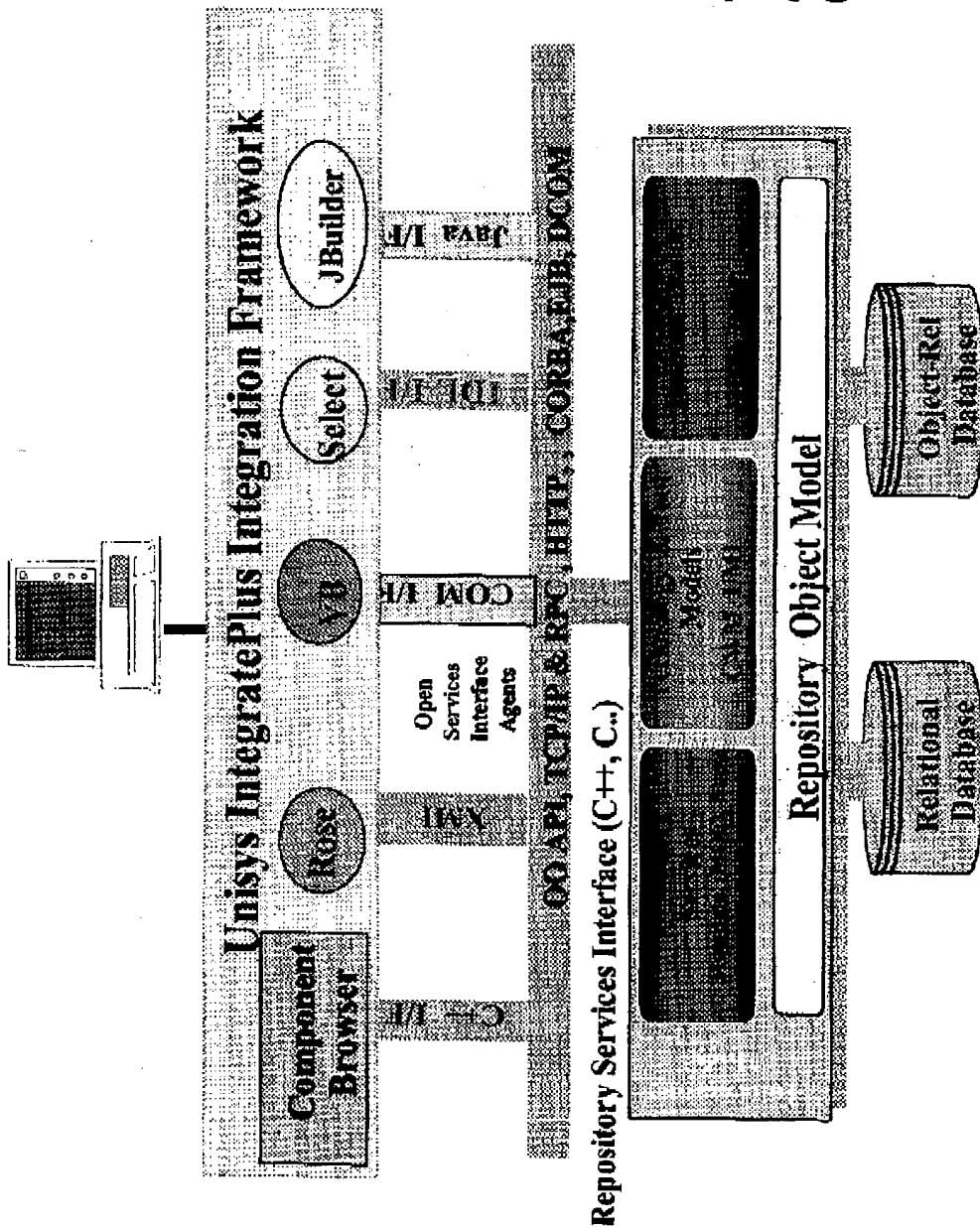
DESKTOP  
OBJECTS  
ActiveX, Java

CORBA  
DCOM

TECHNICAL  
& BUSINESS  
OBJECTS

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## XML : Concept to Standard to Implementation in record time

|       |   |
|-------|---|
| 12/97 | SMIF (Stream based Model Interchange<br>Format) RFP issued by OMG |
| 07/98 | Initial submissions (XML, CDIF, UOL)                              |
| 10/98 | Revised submission (XML)  |
| 11/98 | Proof of concept demonstrations                                   |
| 01/99 | OMG Technology Adoption begins                                    |
| 03/99 | Initial implementations arrive                                    |

29 Co-submitters and supporters

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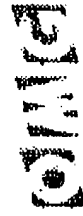
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## XMI Evolution

- Managed by OMG Process
- XMI Revision Task Force
  - xmi-rtf@omg.org
  - Members tracking W3C progress
- What is ahead?
  - Evolve with XML (Eg: Namespaces, XML Schema...)
  - Evolve with MOF and UML

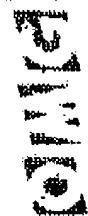
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## OMG & Meta-Data Coalition

- Microsoft joins MDC and transfers OIM
- Have established liaisons with each other
- Joint OMG/MDC meeting in Philadelphia 3/23
- Collaboration has begun
  - MDC already using OMG UML as a foundation for its Open Information Model
  - Additional collaboration areas under discussion
    - OMG Common Warehouse Metadata Interchange RFP
    - MDC Business Rules and Knowledge Management Models
  - Some companies are members in both organizations
- Next few months will be interesting!

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# Summary of Object Repository Industry Efforts and XMI Directions

- Repositories and Tools will be used to construct integrated software suites (build, manage, execution)
- Partial list of Object Repository efforts underway
 

|   |                     |
|---|---------------------|
| – Unisys Universal Repository - UREP : 2Q95 | {OO: MOF, XML, COM} |
| – IBM TeamConnection : 1996                 | {OO: MOF, XMI}      |
| – Microsoft/Platinum/CA Repository : 1Q97   | {OO: COM, MOF, XML} |
| – Oracle Repository : 1999?                 | {OO: MOF, XMI}      |
- Other Repositories (non object)
  - PR/MVS and PR/OEE
  - ViaSoft Rochade
  - Softlab Enabler
  - Many tool specific repositories

{OO} Implies Object Orientation is foundational and not an 'after thought'

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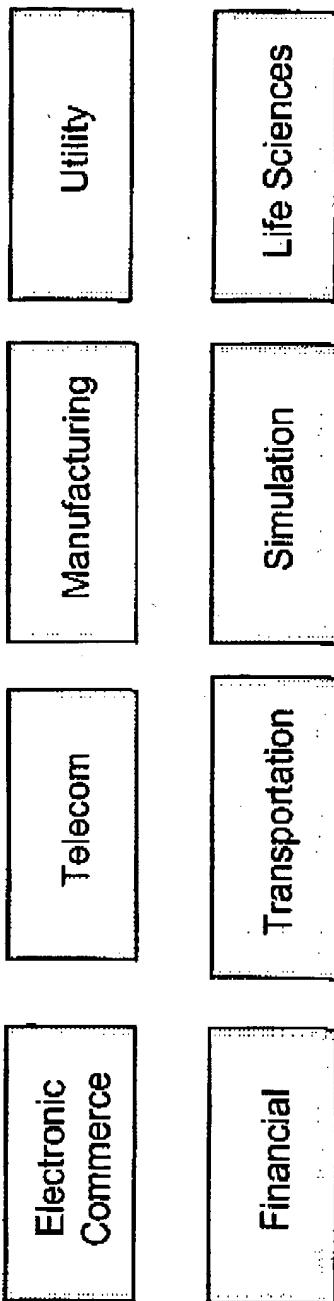
## XMI and OMG Current Efforts

- The following standard DTDs are now available on [www.omg.org](http://www.omg.org)
  - OMG MOF 1.1 & UML 1.1
- The following proposed DTDs are being readied in 1999
  - OMG MOF 1.3 & UML 1.3 (June)
  - OMG CORBA Component Model (August)
  - OMG CORBA Interface Repository (August)
  - OMG Common Warehouse Metadata Interchange - CWM (September)...

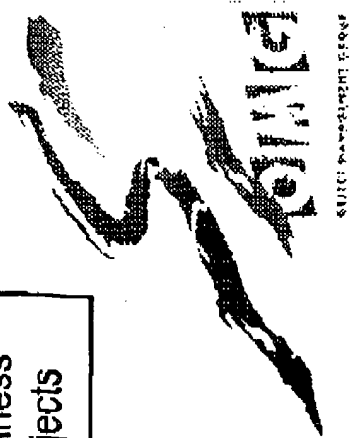
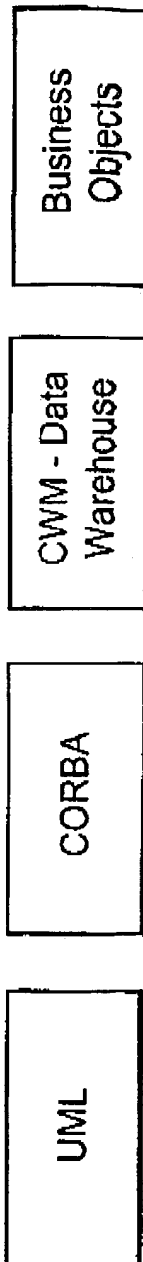
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# XMI and the OMG - The Future

Domain



Platform



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## XML Bandwagon Accelerates

- Vendors and consortia rally around W3C XML
  - OMG XMI for platform and domain technologies
  - XML/EDI
  - Metadata Coalition
  - Microsoft 'BizTalk', SUN Java/XML efforts, IBM XML4J...
  - Enterprise Application Integration
- XML Servers
  - Object Design & Poet XML Repository
  - Blue Stone XML server...

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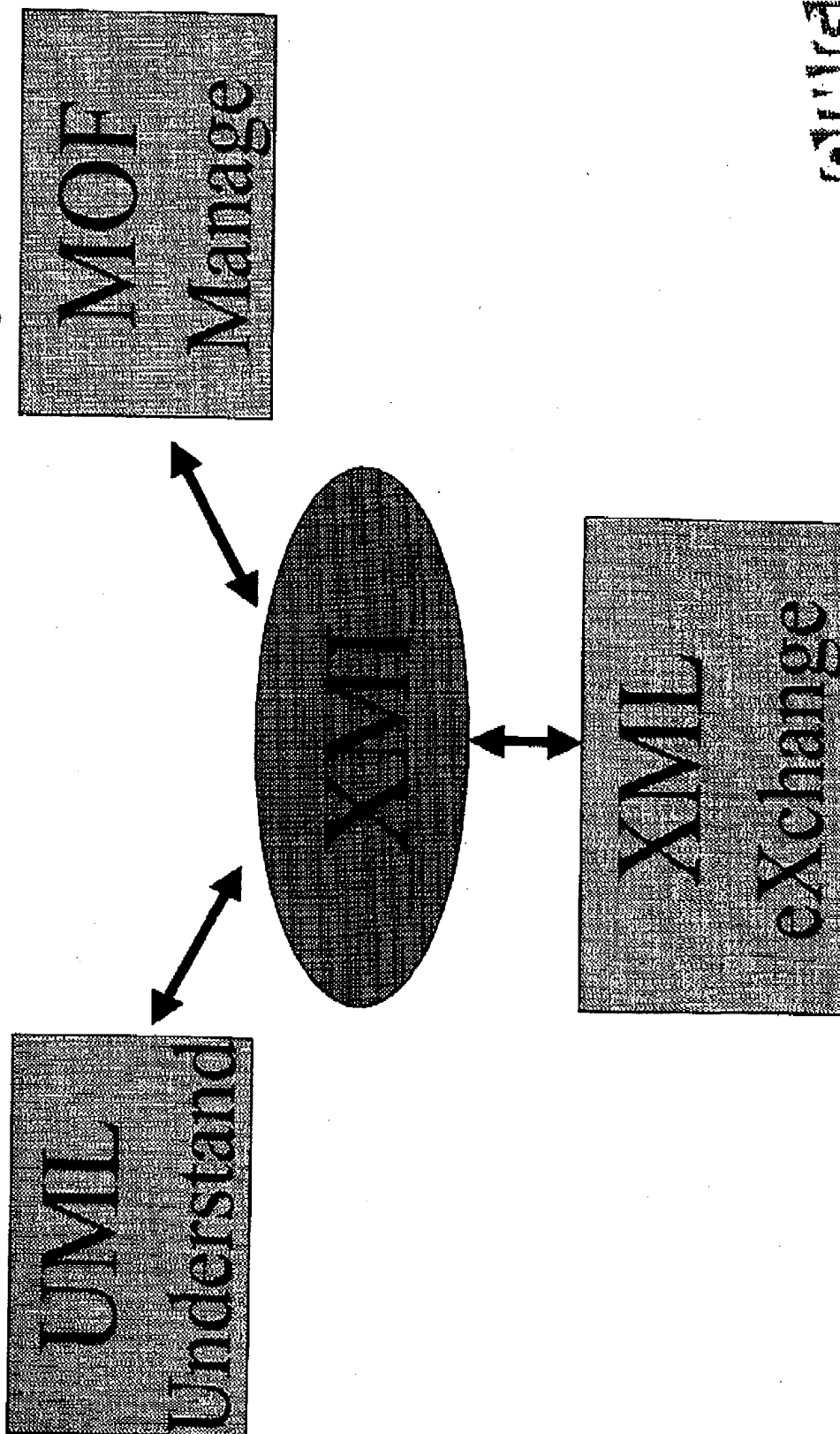
## XMI Summary

- The OMG standard for exchanging (meta)data between tools, repositories and applications
- Works with and builds on existing industry standards (W3C XML, OMG UML & MOF)
- Leverages UML & MOF in the design phase
- Use XML for implementing interchange
- Easy to implement and integrate with existing metadata repositories across the Internet
- Technology and middleware neutral
- OMG Adoption - Completed on March 22, 1999

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# OMG Metadata Summary

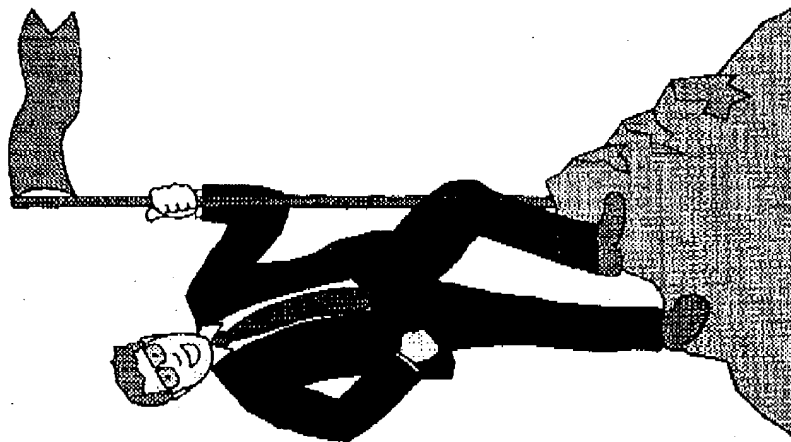


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## Question & Answers



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